PATENT CLAIMS

1. A conveyor screw (8) having a plurality of screw flights (13-20) each extending in a helical path about a longitudinal axis, at least two screw flights (13-16) extend from an inlet end part of the conveyor screw, wherein the outer edges of the two screw flights (13-16) extend in different radial distance from the longitudinal axis.

2. A conveyor screw according to claim 1, wherein at least one screw flight (14-16) extending at a lower radial distance from the longitudinal axis, extends from the inlet end part from substantially the same longitudinal position of the conveyor screw as the screw flight (13) extending at a higher radial distance from the longitudinal axis.

3. A conveyor screw according to claim 1 or 2, wherein one or more screw flights (14-16) extending at a lower radial distance from the longitudinal axis, extends from the inlet end part and along the conveyor screw for between 5% and 65%, preferably between 7% and 50% of the total length thereof.

4. A conveyor screw according to any of the claims 1-3, wherein at least two screw flights (14-16) extending at a lower radial distance from the longitudinal axis, extend from the inlet end part and for different longitudinal distances from the inlet end part.

5. A conveyor screw according to claim 4, wherein the difference in the extension from the inlet end part of said screw flights (14-16) amounts to from 8% to 50%, preferably from 12% to 40% of the total length of the conveyor screw.

6. A conveyor screw according to any of the preceding claims, wherein the pitch of the screw flights (13-16) at the inlet end of the conveyor screw is 0.9 to 1.4, preferably 1.1-1.3.

7. A conveyor screw according to any of the preceding claims, wherein the pitch of the screw flights (17-20) is reduced along the longitudinal direction of the conveyor screw to 0.7 to 1, preferably 0.8 to 0.9 at an outlet end of the conveyor screw.

8. A conveyor screw according to any of the preceding claims, wherein everywhere along the longitudinal direction of the conveyor screw, at least one screw flight (13, 17-20) extends to a given highest radius, so that the complete inner wall of a cylindrical cavity in which the conveyor screw is placed, is scraped by rotation of the conveyor screw.

9. A conveyor screw according to any of the preceding claims, wherein the screw flights (13, 17-20) extending to highest radial distance from the longitudinal axis progress discontinuously in the longitudinal direction, so that a peripherally extending opening exists between these screw flights (13, 17-20) at least at one position along the longitudinal direction.

10. A conveyor screw according to claim 9, wherein said opening or openings extend over 120 to 240° of the periphery, preferably over 150 to 210° of the periphery.

11. A conveyor comprising a stationary part having an inner surface, which closely encloses a conveyor screw (8) according to any of the claims 1-10, drive means (W) for driving a rotation of the conveyor screw (8) about the longitudinal axis thereof, and inlet (6) and outlet (9) to direct a mass to the inlet end (10) of the conveyor screw (7) and from its outlet end, respectively.

12. An apparatus for making ice cream, comprising a through-flow freezer (7) having an inner surface, which closely encloses a conveyor screw (8) according to any of the claims 1-10, drive means (W) for driving a rotation of the conveyor screw (8) about the longitudinal axis thereof, cooling means for cooling the inner surface, and inlet

(6) and outlet (9) to direct an ice cream mass to the inlet end (10) of the conveyor screw (7) and from its outlet end, respectively.

13. An apparatus according to claim 12, wherein the cooling means are adapted to cool down a through-flowing ice cream mass, which enters with a temperature from -1°C to -10°C, with from 4 to 25°C.

14. An apparatus according to claim 12 or 13, wherein the drive means (W) is adapted to drive the conveyor screw (8) with from 10 to 50 rotations per minute, preferably with from 20 to 35 rotations per minute.

15. Method of making an ice cream mass, wherein the ice cream mass is cooled down to a temperature below 0°C, such as from -1°C to -10°C, where after it is fed into the inlet (6) of an apparatus according to any of the claims 12-14.